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CLAIMS:

1. A layered composite, comprising the following layers:

(I) a layer I composition comprising:

(a) from 0 to 80 parts by weight of at least one polyamide selected from the group consisting of PA6, PA66, PA6/66 and mixtures thereof;

(b) from 0 to 100 parts by weight of at least one polyamine-polyamide copolymer comprising the following monomer units:

(α) from 0.5 to 25% by weight, based on the weight of the polyamine-polyamide copolymer, of at least one polyamine having at least 4 nitrogen atoms and having a number-average molar mass M_n of at least 146 g/mol, and

(β) at least one polyamide-forming monomer selected from the group consisting of lactam, ω-aminocarboxylic acid, equimolar combination of diamine and dicarboxylic acid, and mixtures thereof; and

(c) from 0 to 80 parts by weight of at least one polyamide selected from the group consisting of PA11, PA12, PA612, PA1012, PA1212 and mixtures thereof;

wherein, in said layer I, a total of the parts by weight of (a), (b) and (c) is 100;

wherein within an entirety of (a) and (b), at least 20 parts by weight of said entirety comprise monomer units selected from the group consisting of caprolactam, combination of hexamethylenediamine/adipic acid, and mixtures thereof; and

wherein within an entirety of (b) and (c), at least 20 parts by weight of said entirety comprise monomer units selected from the group consisting of ω-aminoundecanoic acid, laurolactam, combination of hexamethylenediamine/1,12-dodecanedioic acid, combination of 1,10-decanediamine/1,12-dodecanedioic acid, combination of 1,12-dodecanediamine/1,12-dodecanedioic acid, and mixtures thereof; and

(II) a layer II composition comprising at least one ethylene-vinyl alcohol copolymer.

2. The composite as claimed in claim 1, wherein the layer I composition comprises at least one selected from the group consisting of:
at least 0.5 part by weight of (a),
at least 0.5 part by weight of (b),
at least 0.5 part by weight of (c),
and combinations thereof.

3. The composite as claimed in claim 1, wherein the layer I composition comprises at least one selected from the group consisting of:
at least 10 parts by weight of (a),
at least 2 parts by weight of (b),
at least 10 parts by weight of (c),
and combinations thereof.

4. The composite as claimed in claim 1, wherein the layer I composition comprises at least one selected from the group consisting of:
at least 20 parts by weight of (a),
at least 5 parts by weight of (b),
at least 20 parts by weight of (c),
and combinations thereof.

5. The composite as claimed in claim 1, wherein the layer I composition comprises at least one selected from the group consisting of:
at least 30 parts by weight of (a),
at least 10 parts by weight of (b),
at least 90 parts by weight of (c),
and combinations thereof.

6. The composite as claimed in claim 1, wherein the layer I composition comprises at least one selected from the group consisting of:
at most 70 parts by weight of (a),
at most 80 parts by weight of (b), and
at most 70 parts by weight of (c).

7. The composite as claimed in claim 1, wherein the layer I composition comprises at least one selected from the group consisting of:
at most 60 parts by weight of (a),
at most 60 parts by weight of (b), and
at most 60 parts by weight of (c).

8. The composite as claimed in claim 1, wherein the layer I composition comprises not more than 40 parts by weight of (b).

9. The composite as claimed in claim 1, wherein the polyamine-polyamide copolymer (b) comprises from 1 to 20% by weight of the polyamine (α).

10. The composite as claimed in claim 1, wherein the polyamine-polyamide copolymer (b) comprises from 1.5 to 16% by weight of the polyamine (α).

11. The composite as claimed in claim 1, wherein the polyamine (α) comprises at least 8 nitrogen atoms.

12. The composite as claimed in claim 1, wherein the polyamine (α) comprises at least 11 nitrogen atoms.

13. The composite as claimed in claim 1, wherein the polyamine (α) has a number-average molar mass M_n of at least 500 g/mol.

14. The composite as claimed in claim 1, wherein the polyamine (a) has a number-average molar mass M_n of at least 800 g/mol.

15. The composite as claimed in claim 1, wherein an amino group concentration in the polyamine-polyamide copolymer (b) is in the range from 100 to 2,500 mmol/kg.

16. The composite as claimed in claim 1, wherein the layer I composition comprises at least one block copolymer comprising (a) and (c) monomer units.

17. The composite as claimed in claim 1, further comprising at least one layer comprising at least one selected from the group consisting of PA11, PA12, PA612, PA1012, PA1212, and combinations thereof.

18. The composite as claimed in claim 1, further comprising at least one layer comprising at least one selected from the group consisting of PA6, PA66, PA6/66, and combinations thereof.

19. The composite as claimed in claim 1, wherein the composite comprises two of the I layers.

20. The composite as claimed in claim 1, further comprising at least one regrind layer.

21. The composite as claimed in claim 1, wherein the composite comprises a layer sequence I/II/I.

22. The composite as claimed in claim 1, wherein the composite comprises the following sequence of layers:
(a) layer comprising at least one selected from the group consisting of PA11, PA12, PA612, PA1012, PA1212, and combinations thereof;
(b) layer I;

(c) layer II; and

(d) layer comprising at least one selected from the group consisting of PA6, PA66, PA6166, and combinations thereof.

23. The composite as claimed in claim 1, comprising at least one outer layer comprising at least one selected from the group consisting of PA11, PA12, PA612, PA1012, PA1212, and combinations thereof.

24. The composite as claimed in claim 1, comprising at least one electrically conductive layer.

25. The composite as claimed in claim 1, comprising at least one innermost layer and further comprising at least one electrically conductive layer adjacent to the innermost layer.

26. The composite as claimed in claim 1, wherein the polyamides in at least one of (a), (c) or both comprise not more than 50% by weight of additives.

27. The composite as claimed in claim 1, wherein the composite is in the form of a tube.

28. The composite as claimed in claim 1, wherein at least one region of the composite has a corrugated shape.

29. The composite as claimed in claim 1, wherein the composite is in the form of a hollow article.

30. The composite as claimed in claim 1, comprising at least one outermost layer, and further comprising an elastomer layer adjacent to the outermost layer.

31. A tubular article selected from the group consisting of fuel pipe, brake-fluid pipe, coolant pipe, hydraulic-fluid pipe, fuel-pump pipe, air-conditioner pipe,

and a vapor line, comprising the composite as claimed in claim 1.

32. An article selected from the group consisting of a container, fuel container, filler pipe, and filler pipe for a tank, comprising the composite as claimed in claim 1.

33. A film, comprising the composite as claimed in claim 1.

34. A method for preparing the composite as claimed in claim 1, comprising at least one selected from the group consisting of multicomponent injection molding, coextrusion, and coextrusion blow molding at least one of the layers I, II, or both.

35. A molding composition, comprising the following components:

(a) from 0 to 80 parts by weight of at least one polyamide selected from the group consisting of PA6, PA66, PA6/66 and mixtures thereof;

(b) from 0.5 to 100 parts by weight of at least one polyamine-polyamide copolymer comprising the following monomer units:

(α) from 0.5 to 25% by weight, based on the weight of the polyamine-polyamide copolymer, of at least one polyamine having at least 4 nitrogen atoms and having a number-average molar mass M_n of at least 146 g/mol, and

(β) at least one polyamide-forming monomer selected from the group consisting of lactam, ω-aminocarboxylic acid, equimolar combination of diamine and dicarboxylic acid, and mixtures thereof; and

(c) from 0 to 80 parts by weight of at least one polyamide selected from the group consisting of PA11, PA12, PA612, PA1012, PA1212 and mixtures thereof;

wherein, a total of the parts by weight of (a), (b) and (c) is 100;

wherein within an entirety of (a) and (b), at least 20 parts by weight of said entirety comprise monomer units selected from the group consisting of caprolactam, combination of hexamethylenediamine/adipic acid, and mixtures thereof; and

wherein within an entirety of (b) and (c), at least 20 parts by weight of said entirety comprise monomer units selected from the group consisting of ω-aminoundecanoic acid, laurolactam, combination of hexamethylenediamine/1,12-dodecanedioic acid, combination of 1,10-decanediamine/1,12-dodecanedioic acid, combination of 1,12-dodecanediamine/1,12-dodecanedioic acid, and mixtures thereof.

36. A molding composition, comprising the following components:

(a) from 0 to 80 parts by weight of at least one polyamide selected from the group consisting of PA6, PA66, PA6/66 and mixtures thereof;

(b) from 0 to 100 parts by weight of at least one polyamine-polyamide copolymer comprising the following monomer units:

  (α) from 0.5 to 25% by weight, based on the polyamine-polyamide copolymer, of a polyamine having at least 4 nitrogen atoms and having a number-average molar mass M_n of at least 146 g/mol, and

  (β) at least one polyamide-forming monomer selected from the group consisting of lactam, ω-aminocarboxylic acid, equimolar combination of diamine and dicarboxylic acid, and mixtures thereof; and

(c) from 0 to 80 parts by weight of at least one polyamide selected from the group consisting of PA11, PA12, PA612, PA1012, PA1212 and mixtures thereof;

wherein a total of the parts by weight of (a), (b) and (c) is 100;

wherein within an entirety of (a) and (b), at least 20 parts by weight of said entirety comprise monomer units selected from the group consisting of caprolactam, combination of hexamethylenediamine/adipic acid, and mixtures thereof;

wherein within an entirety of (b) and (c), at least 20 parts by weight of said entirety comprise monomer units selected from the group consisting of ω-aminoundecanoic acid, laurolactam, combination of hexamethylenediamine/1,12-dodecanedioic acid, combination of 1,10-decanediamine/1,12-dodecanedioic acid, combination of 1,12-dodecanediamine/1,12-dodecanedioic acid, and mixtures thereof; and

wherein said molding composition comprises at least one block copolymer comprising (a) and (c) monomer units.